

AMENDMENTS TO THE CLAIMS

Cancel claims 1-13.

Add the following new claims:

14. (New) A rotary indexing machine comprising:

a fixed base unit,

a rotary table which is rotatable relative to the base unit about a vertical indexing axis,

a satellite arranged on the rotary table so as to be rotatable about a vertical satellite rotation axis relative to the rotary table, the satellite being provided with at least one clamping device for clamping a workpiece,

a satellite drive device, which is arranged on the rotary table, is moved along with the latter and permits rotation of the satellite about the satellite rotation axis during the rotation of the rotary table about the indexing axis,

the satellite has a shaft, which leads through the rotary table, is rotatable relative to the rotary table about the satellite rotation axis and is connected to the satellite in a rotationally locked manner and on whose end face facing the base unit a Hirth serration system is arranged, and

an indexing device is arranged on the base unit, the indexing device having a column or annular disk, which is linearly displaceable parallel to the indexing axis and on whose end face facing the rotary table a Hirth serration system corresponding to

the Hirth serration system on the satellite shaft is arranged, the arrangement being such that, to index the satellite, the Hirth serration system of the indexing device is displaced linearly in the direction of the rotary table in order to mesh with the Hirth serration system of the satellite and thereby effects the indexing of the satellite, and, to release the indexing, the Hirth serration system of the indexing device is displaced linearly in the direction away from the rotary table.

15. (New) The rotary indexing machine according to claim 14, including first and second machining units having a work spindle wherein a machining unit with an associated fastening device being designed for lateral attachment of the machining unit to a side wall alternatively in a first position with essentially a horizontally arranged work spindle or in a second position with essentially a vertically arranged work spindle.

16. (New) The rotary indexing machine according to claim 14, having a fixed machine frame, which is designed for holding a multiplicity of machining units, the rotary table rotatable relative to the machine frame about a vertical indexing axis,

at least one support, said support comprising a first side wall extending towards a center of the rotary indexing machine and being provided with a first fastening device for fastening a first

one of said machining units and a second side wall extending towards the center of the rotary indexing machine and being provided with a second fastening device for fastening a second one of said machining units.

17. (New) The rotary indexing machine according to claim 14, further comprising a clamping device arranged on the rotary table, in which a clamping device is clamped to a workpiece,

a first machining unit being fastened to a top fastening device and having a first work spindle provided with a first tool,

a second machining unit being fastened to a bottom fastening device and having a second work spindle provided with a second tool,

said first and second machining units being arranged such that the two tools are in engagement with the workpiece simultaneously.

18. (New) The rotary indexing machine according to claim 14, including first and second work spindles being movable independently of one another with three translatory degrees of freedom.

19. (New) The rotary indexing machine according to claim 14, including two side walls being arranged in a wedge shape on an essentially vertically extending section of a support, so that the

tip of the wedge shape is directed in radial direction toward an indexing axis.

20. (New) The rotary indexing machine according to claim 14, including two side walls being arranged in a wedge shape on an essentially vertically extending section of a support, so that the tip of the wedge shape is directed in radial direction toward an indexing axis, wherein the tip of the wedge shape encloses an angle which is less than approximately 45 degrees.

21. (New) The rotary indexing machine according to claim 14, wherein a drive means for driving the rotary table comprises an electrical machine designed as a directly driven rotary spindle and having a stator which is firmly connected to the fixed base unit and a rotor which is firmly connected to the rotary table.

22. (New) The rotary indexing machine according to claim 14, further comprising:

a drive means for driving the rotary table which comprises an electrical machine designed as a directly driven rotary spindle and having a stator which is firmly connected to the fixed base unit and a rotor which is firmly connected to the rotary table.

23. (New) The rotary indexing machine according to claim 22, wherein the rotary indexing machine also comprises a measuring device for the exact measurement of the position and the speed of the rotor relative to the stator and a circuit arrangement, comprising a cascade controller with feedback of the speed and the position, for controlling the directly driven rotary spindle.

24. (New) A method of constructing a rotary indexing machine according to claim 23, wherein the method comprises:

based on the harmonic balance method of optimizing; and
a step of providing system parameters of the directly driven rotary spindle and of the circuit arrangement for controlling the directly driven rotary spindle.

25. (New) A rotary indexing machine according to claim 14, further comprising:

a fixed pedestal and the rotary table rotatable relative to the pedestal about a vertical indexing axis, wherein a chip conveying device is arranged below the rotary table for disposal of chips and is designed for conveying the chips around the pedestal or around a fixed base unit of the rotary indexing machine up to an outlet opening.

26. (New) The rotary indexing machine according to claim 25, wherein a fixed collecting device for collecting chips, coolants or lubricants is formed and arranged in a funnel shape below the rotary table so that the chips are conveyed to the chip conveying device essentially by the force of gravity.